UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GOOGLE LLC,
Petitioner,

v.

IPA TECHNOLOGIES INC.,
Patent Owner.

_____

IPR2019-00733
Patent 7,036,128 B1

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Before KEN B. BARRETT, TREVOR M. JEFFERSON, and
BART A. GERSTENBLITH, *Administrative Patent Judges*.

BARRETT, Administrative Patent Judge.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I.   INTRODUCTION

A. Background and Summary

Google LLC ("Petitioner")[1] filed a Petition requesting *inter partes* review of U.S. Patent No. 7,036,128 B1 ("the '128 patent," Ex. 1001). Paper 1 ("Pet."). The Petition challenges the patentability of claims 1–12, 20, and 21 of the '128 patent. We instituted an *inter partes* review of all challenged claims on all proposed grounds of unpatentability. Paper 13, 38. IPA Technologies, Inc. ("Patent Owner")[2] filed a Response to the Petition. Paper 36 ("PO Resp."). Petitioner filed a Reply (Paper 46, "Pet. Reply") and Patent Owner filed a Sur-reply (Paper 50, "PO Sur-reply"). An oral hearing was held on June 4, 2020, and a transcript of the hearing is included in the record. Paper 53 ("Tr.").

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–12, 20, and 21 of the '128 patent are unpatentable.

B. Related Proceedings

One or both parties identify, as matters involving or related to the '128 patent, *IPA Technologies Inc. v. Google LLC*, No. 1:18-cv-00318 (D. Del. Feb. 26, 2018); *IPA Technologies Inc. v. Microsoft Corp.*, No. 1:18-cv-00001 (D. Del. Jan. 2, 2018); *IPA Technologies Inc. v. Amazon.com, Inc.*

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[1] Petitioner identifies Google LLC as the real party-in-interest. Pet. 2.
[2] Patent Owner identifies as the real party-in-interest "Patent Owner, IPA Technologies Inc., which is a wholly owned subsidiary of Wi-LAN Technologies Inc. . . . , which is a wholly owned subsidiary of Wi-LAN Inc. . . . , which is a wholly owned subsidiary of Quarterhill Inc." Paper 4, 2; Paper 12, 2.

et al., No. 1:16-cv-01266 (D. Del. Dec. 19, 2016); and Patent Trial and

Appeal Board cases *Google LLC v. IPA Technologies Inc.*, IPR2019-00734,

IPR2019-00735, and IPR2019-00736, and *Microsoft Corporation v. IPA*

Technologies Inc., IPR2019-00838, IPR2019-00839, and IPR2019-00840.

Pet. 2; Paper 4, 2; Paper 12, 2.

C. The '128 Patent

The '128 patent is titled "Using a Community of Distributed

Electronic Agents to Support a Highly Mobile, Ambient Computing

Environment" and describes "software-based architectures for

communication and cooperation among distributed electronic agents to

incorporate elements such as GPS or positioning agents and speech

recognition into a highly mobile computing environment." Ex. 1001,

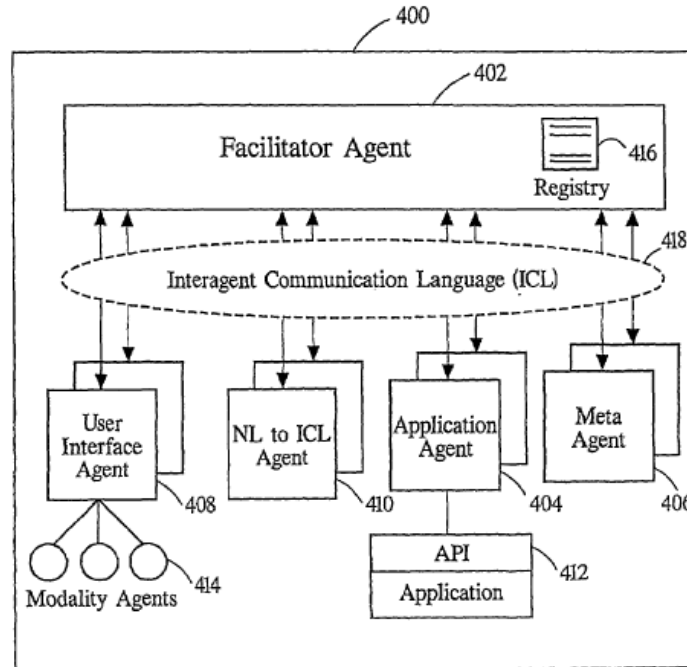code (54), 1:23–27. Figure 4 of the '128 patent is reproduced below.

Fig. 4

Figure 4 depicts the structure of an exemplary distributed agent system of

the '128 patent. *Id.* at 6:47–52. Figure 4 shows that system 400 includes

facilitator agent 402, user interface agents 408, application agents 404, and meta-agents 406. *Id.* The '128 patent explains that system 400 is organized "as a community of peers by their common relationship" to facilitator agent 402 (*id.* at 6:50–52), which is "a specialized server agent that is responsible for coordinating agent communications and cooperative problem-solving" (*id.* at 6:54–57).

The '128 patent discloses that cooperation among agents is structured around a three-part approach as follows: (1) providers of services register their capabilities specifications with a facilitator; (2) requesters of services construct goals and relay them to a facilitator; and (3) the facilitator coordinates the efforts of the appropriate service providers in satisfying these goals. *Id.* at 10:65–11:6. Such cooperation among agents is achieved via messages expressed in a common language, called the Interagent Communication Language ("ICL"). *Id.* at 10:66–11:1, 7–13.

Referencing Figures 3 and 4, the '128 patent describes a preferred embodiment for the operation of a distributed agent system. *Id.* at 7:34–60. The '128 patent describes that, when invoked, a client agent makes a connection to a facilitator and registers with the facilitator a specification of the capabilities and services it can provide. *Id.* For example, a natural language agent may register the characteristics of its available natural language vocabulary. *Id.* When facilitator agent 402 receives a service request and determines that registered services 416 of one of its client agents will help satisfy a goal of the request, the facilitator sends that client a request expressed in ICL 418. *Id.* at 7:46–55. The client agent parses this request, processes it, and returns answers or status reports to the facilitator. *Id.*

Referencing Figures 5 and 6, the '128 patent describes an exemplary embodiment where user interface agent 408 runs on a user's laptop, accepts user input, sends requests to facilitator agent 402 for delegation to appropriate agents, and displays the results of the distributed computation. *Id.* at 8:7–24. The '128 patent illustrates that, when the question "What is my schedule?" is entered on user interface (UI) 408, UI 408 sends the request to facilitator agent 402, which in turn asks natural language (NL) agent 426 to translate the query into ICL. *Id.* at 8:25–37. The translated ICL expression is then routed by facilitator agent 402 to appropriate agents, e.g., calendar agent 434, to execute the request. *Id.* Finally, results are sent back to UI agent 408 for display. *Id.*

The '128 patent also describes an embodiment directed to mobile users, such as those in a car. *Id.* at 30:23–54. According to the '128 patent, "the present invention enables intelligent collaboration among agents including user interface agents for providing an ambient interface well suited for the mobile environment . . . , as well as location-aware agents providing current positional information through technologies such as Global Positioning System ('GPS')." *Id.* at 30:37–43. The '128 patent explains that "[n]ew technology such as Global Positioning System (GPS), wireless phones, wireless internet, and electronic controls are currently available in cars to improve the way people drive and manage the time spent in automobiles." *Id.* at 30:47–50. The '128 patent states that the disclosed invention "manages this heavy flow of data and keeps the cognitive load as low as possible for the driver" by providing a speech-enabled touchscreen device. *Id.* at 30:50–54.

D. Illustrative Claim

Of the challenged claims of the '128 patent, only claim 1 is an independent claim. The remaining challenged claims depend directly or indirectly from claim 1. Claim 1, reproduced below with emphasis added and bracketed annotations[3] inserted, is illustrative.

> 1.[pre] A collaborative computer-implemented community of distributed electronic agents, organized to provide a mobile computing environment, the computer-implemented community of distributed electronic agents comprising:
>
> [1.a] an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), [1.b] wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and [1.c] wherein the parameter lists further refine the one or more events;
>
> [1.d] a facilitator agent arranged to coordinate cooperative task completion among the electronic agents by delegating one or more received ICL goals to a selected one or more of the electronic agents based upon the registered capabilities of the selected agents;
>
> [1.e] one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least one location agent operable to ascertain a current physical location of a user; and
>
> [1.f] one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request.

Ex. 1001, 35:27–53 (emphasis added).

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[3] We utilize Petitioner's annotations for claim 1 but have retained the paragraph formatting from the issued patent.

E. Evidence

Petitioner relies on the following references:

Reference	Exhibit No.
David L. Martin, Adam J. Cheyer, and Douglas B. Moran, *Building Distributed Software Systems with the Open Agent Architecture*, PROCEEDINGS OF THE THIRD INTERNATIONAL CONFERENCE ON THE PRACTICAL APPLICATION OF INTELLIGENT AGENTS AND MULTI-AGENT TECHNOLOGY 355 (1998) ("Martin")[4]	1011
US 5,528,248; filed Aug. 19, 1994; issued June 18, 1996 ("Steiner")	1028
US 5,608,635; filed Nov. 17, 1994; issued Mar. 4, 1997 ("Tamai")	1029
US 5,835,881; filed Jan. 16, 1996; issued Nov. 10, 1998 ("Trovato")	1030
WO 93/05492; filed Aug. 28, 1992; published Mar. 18, 1993 ("Anagnostopoulos")	1031
US 6,009,355; filed Jan. 28, 1997; issued Dec. 28, 1999 ("Obradovich")	1032

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[4] Prior to institution, Patent Owner argued that the pertinent portions of the Martin reference (listing as authors Martin, Cheyer, and Moran) and the '128 patent (naming as inventors Julia and Cheyer) are the work of a common inventive entity and therefore cannot be used as prior art. *See, e.g.*, Paper 6 (Prelim. Resp.), 41 (section heading: "*Martin* . . . is Not the Work of Another"); *id.* at 47 ("*Martin* represents the work of joint-inventor Cheyer and should not be considered as a ¶ 102(a) reference."); Paper 10 (Patent Owner's pre-institution sur-reply), 1. Patent Owner does not raise that argument in its Patent Owner Response and has waived the issue. *See* Paper 31, 8 (Scheduling Order; "Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived."); Patent Trial and Appeal Board Consolidated Trial Practice Guide (November 2019) 52 (citing *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016)).

Reference	Exhibit No.
US 5,434,907; filed Mar. 13, 1992; issued July 18, 1995 ("Hurst")	1033

Petitioner also relies on the Declaration of Dr. Dan R. Olsen, Jr. (Ex. 1002) in support of its arguments. The parties rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 5, 20, 21	103(a)	Martin, Steiner
3	103(a)	Martin, Steiner, Tamai
4	103(a)	Martin, Steiner, Trovato
6	103(a)	Martin, Steiner, Anagnostopoulos, Tamai
7–11	103(a)	Martin, Steiner, Obradovich
12	103(a)	Martin, Steiner, Obradovich, Hurst

II.   ANALYSIS

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish by a preponderance of the evidence that the challenged claims are unpatentable. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) any objective evidence of obviousness or non-obviousness.[5] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation marks and citation omitted).

Petitioner's declarant, Dr. Olsen, opines that a person of ordinary skill in the art at the time of the invention of the '128 patent would have had at least a Bachelor's degree in computer science, electrical engineering, or a similar discipline, and one to two years of work experience in networked computer systems or a related area. Ex. 1002 ¶ 14; *see* Pet. 5. Patent Owner does not dispute Dr. Olsen's assessment of the level of ordinary skill in the art. PO Resp. *passim*.

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[5] The parties have not directed our attention to any objective evidence of obviousness or non-obviousness.

We find Dr. Olsen's definition consistent with the level of ordinary skill in the art reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Therefore, we adopt Dr. Olsen's definition of the level of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review requested in a petition filed on or after November 13, 2018, we apply the same claim construction standard used in district courts, namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

We determine that no claim terms require express construction in order to resolve the parties' disputes. *See* Pet. 20 ("[T]he Board need not construe any terms of the challenged claims to resolve the underlying

controversy, as any reasonable construction reads on the prior art."); Paper 6
("Prelim. Resp."), 5–6 (Patent Owner stating, under the "Claim
Construction" heading, "it is not necessary for the Board to construe any
terms to determine whether it should institute review."); PO Resp. i (Patent
Owner's table of contents lacking a section heading for "Claim
Construction").

D. The Alleged Obviousness of Claims 1, 2, 5, 20, and 21 Over Martin and Steiner

Petitioner alleges that claims 1, 2, 5, 20, and 21 of the '128 patent
would have been obvious over Martin and Steiner. *See* Pet. 21–41
(addressing claim 1). Petitioner contends that Martin teaches much of the
claimed subject matter of independent claim 1, and turns to Steiner for
certain location-related teachings. *See id.* Petitioner argues that it would
have been obvious "in view of *Steiner* to configure *Martin's* community of
agents to implement [location agent] features." *Id.* at 35 (citing Ex. 1002
¶ 97). Patent Owner argues that Steiner is not analogous art, that
Petitioner's reasoning to combine the references is inadequate, and that
Petitioner does not explain how to combine Martin and Steiner. *See, e.g.*,
PO Resp. 1–3.

1. Overview of Martin (Ex. 1011)

Martin relates to the Open Agent Architecture (OAA), which "makes
it possible for software services to be provided through the cooperative
efforts of distributed collections of autonomous agents." Ex. 1011, 355[6]
(Abstr.). According to Martin, "[c]ommunication and cooperation between

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[6] We, like Petitioner, cite herein to the page numbers in the Martin reference (Exhibit 1011) rather than the page numbers of the exhibit.

agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents." *Id.*
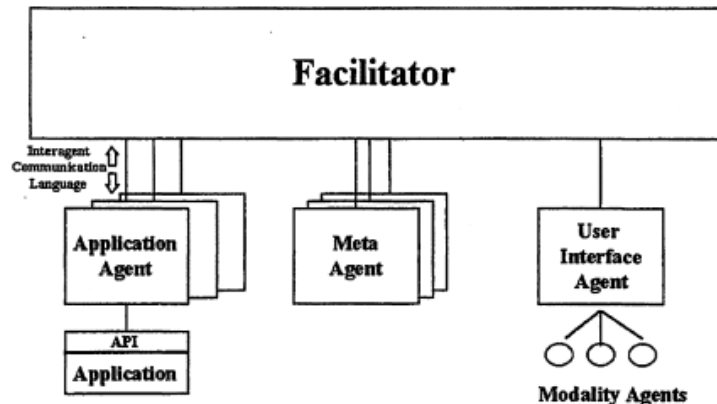
Figure 1 of Martin is reproduced below.

Figure 1: OAA System Structure.

Figure 1 depicts the structure typical of a small OAA system, showing a user interface agent, several application agents, and meta-agents, organized as a community of peers by their common relationship to a facilitator agent. *Id.* at 359. Figure 1 also shows an Interagent Communication Language. *Id.* at 361, Fig. 1.

According to Martin, cooperation among the agents of an OAA system is achieved via messages expressed in a common language, Interagent Communication Language (ICL). *Id.* at 362. Martin describes "Mechanisms of Cooperation" as follows.

> Cooperation among the agents of an OAA system is achieved via messages expressed in a common language, ICL, and is normally structured around a 3-part approach: providers of services register capabilities specifications with a facilitator; requesters of services construct goals and relay them to a facilitator, and facilitators coordinate the efforts of the appropriate service providers in satisfying these goals.

Id.

According to Martin, all agents that are not facilitators are called client agents. *Id.* at 361. Martin describes that when invoked, a client agent makes a connection to a facilitator. *Id.* at 361–62. Upon connection, an agent informs the facilitator of the services it can provide. *Id.* at 362. When the agent is needed, the facilitator sends it a request expressed in ICL. *Id.* The agent parses this request, processes it, and returns answers or status reports to the facilitator. *Id.*

Martin discloses a "Multimodal Map application, in which a user issues commands on a map by drawing, writing and speaking[.]" *Id.* at 359. The Multimodal Map application is described as "Pen/Voice interface to distributed web data." *Id.* at 360 (Table 1, "A partial list of applications written using OAA.").

2. *Overview of Steiner (Ex. 1028)*

Steiner pertains to the use of a satellite-based location determination system, Global Positioning System (GPS), with a personal digital computing device (PDA). Ex. 1028, 3:16–17, 6:1–6. Steiner describes the disclosed device as follows.

> A Personal Digital Location Apparatus for displaying a geographical location as an icon on a map. The apparatus includes a GPS Smart Antenna for determining the geographical location, a personal computing device including a display, a processing system including a standard software operating system . . . , and a map application program capable of running in the operating system.

Id., code (57) (Abstr.).

3. *Whether Steiner is Analogous Art*

Patent Owner argues that Steiner is non-analogous art and, therefore, cannot be combined with Martin. PO Resp. 1–2; *see id.* at 8.

Two separate tests define the scope of analogous prior art:
"(1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved." *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (citations omitted).

a. Field of Endeavor

The field of endeavor test "rests on an assessment of the nature of the application and claimed invention in addition to the level of ordinary skill in the art." *In re Bigio*, 381 F.3d at 1326. We "determine the appropriate field of endeavor by reference to explanations of the invention's subject matter in the patent application, including the embodiments, function, and structure of the claimed invention." *Id.* at 1325 (citations omitted).

Patent Owner argues that Steiner is not in the same field of endeavor as the claimed invention. PO Resp. 8–15; PO Sur-reply 3–9. Patent Owner contends that the field of endeavor of the claimed invention is "computer environments and communication among software agents within a distributed computing environment." PO Resp. 10; PO Sur-reply 5. Patent Owner further contends that, in contrast, the field of endeavor of Steiner is "multiple uses of memory cartridges and serial interfaces for Personal Digital Assistants." PO Sur-reply 3 (quoting Ex. 1028, 1:9–10); *see* PO Resp. 9 (quoting Ex. 1028, 1:9–10). Patent Owner asserts that "*Steiner* discloses the creation of a physical Personal Digital Assistant with specific features, such as built-in memory storage, internal power source, GPS Smart Antenna that receives GPS satellite signals and provides GPS location information." PO Resp. 10 (citing Ex. 1028, 6:1–11); *see also id.* at 15

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(Patent Owner characterizing "personal GPS devices" as "the focus of *Steiner*").

Petitioner, on the other hand, contends that the field of endeavor involves a location aspect, specifically arguing that "[t]he '128 patent is directed, among other things, to the incorporation of 'GPS or position agents . . . into a highly mobile computing environment.'" Pet. Reply 2 (quoting Ex. 1001, 1:25–27). Regarding the reference, Petitioner argues that, "[j]ust like the '128 patent, *Steiner* is also directed to the incorporation of GPS into a mobile computing environment to provide map information." *Id.* at 3.

The '128 patent issued from a continuation-in-part application. Ex. 1001, code (63). According to Patent Owner, the disclosed subject matter in the '128 patent that is new relative to its parent application includes Figures 17–25 and the discussion at column 30, line 7, through column 35, line 17. Prelim. Resp. 39. Patent Owner asserts that "[t]he new '128 Patent material concerns 'Distributed Agents in a Highly Mobile, Ambient Computing Environment,' and specifically discusses the use of GPS, control of navigation systems, control of automobile sound systems, and interface and control of car entertainment centers." *Id.* (citing Ex. 1001, 30:23–32:63). These concepts of mobility, GPS, and navigation are found in the language of independent claim 1 calling for at least one of the service-providing electronic agents to be a "location agent operable to ascertain a current physical location of a user." Ex. 1001, 35:43–46. The preamble ties together the concepts of mobility and of distributed agents in reciting a "community of distributed electronic agents, organized to provide a mobile computing environment." *Id.* at 35:27–29.

The specification of the '128 patent, in the "Field of Invention" section, explains:

> The present invention is related to distributed computing environments and the completion of tasks within such environments. In particular, the present invention teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment.

Ex. 1001, 1:20–27. The Specification further describes the combination of distributed agent architecture and location detection for a mobile computing environment. *See, e.g.*, *id.* at 30:6–21 ("In another preferred embodiment of the present invention an application of the collaborative OAA architecture is provided which addresses the post-desktop, mobile/ubiquitous computing environment. The present invention addresses the highly mobile computing environment by incorporating elements such as: GPS agents, . . . by using autonomous service-providing electronic agents associated with available resources . . . ."); *id.* at 30:37–45 ("In addition, the present invention enables intelligent collaboration among agents including . . . location-aware agents providing current positional information through technologies such as Global Positioning System ('GPS'). Such collaboration yields powerful results greatly enhancing the mobile user's experience . . . .").

Neither party's proposed definition of the '128 patent's field of endeavor is complete, with Patent Owner focusing on a distributed computing environment and Petitioner focusing on location ascertainment. PO Resp. 8–10; Pet. Reply 2–3. The person of ordinary skill in the art would recognize that the field of endeavor includes both components. We determine that the field of endeavor of the '128 patent is, as stated in the Field of Invention, "communication and cooperation among distributed

electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment." Ex. 1001, 1:20–27; *see In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979) (characterizing the "field of the art" statement in the Background of Invention section of the specification as a "more realistic description of the field in which appellants endeavored").

Steiner's "Field of Invention" section states that "[t]his invention relates to multiple uses of memory cartridges and serial interfaces for Personal Digital Assistants." Ex. 1028, 7:7–10. However, this statement, which conspicuously omits any reference to GPS, is not a complete picture of Steiner's field. The title of the Steiner patent is more indicative, stating, "Personal Digital Location Assistant Including a Memory Cartridge, a GPS Smart Antenna and a Personal Computing Device." *Id.*, code (54). In that same vein, the Abstract offers the following description of the disclosed subject matter:

> A Personal Digital Location Apparatus for displaying a geographical location as an icon on a map. The apparatus includes a GPS Smart Antenna for determining the geographical location, a personal computing device including a display, a processing system including a standard software operating system such as DOS, Windows, Macintosh, or Geoworks, and a map application program capable of running in the operating system.

Id., code (57).

Patent Owner argues that "*Steiner* is not related to . . . communication among software agents within a distributed computing environment, and thus, is in a different field of endeavor than the '128 Patent." PO Resp. 10; *see also* PO Sur-reply at 5. Petitioner, in its field of endeavor argument and consistent with the description in Steiner's abstract, characterizes Steiner as

being "directed to the incorporation of GPS into a mobile computing environment to provide map information." Pet. Reply 3. Petitioner, however, does not direct us to any indication that Steiner's endeavor involves a distributed computing environment. *See id.* at 1–5; *cf.* PO Sur-reply 8 (arguing that no form of the term "agent" appears in Steiner and that Steiner's device is not capable of communicating in a distributed computing environment). We determine that Steiner is not in the same field of endeavor as the '128 patent.

Petitioner relies on teachings from another prior art reference, Martin, in arguing that Steiner is in the same field of endeavor as the '128 patent. Pet. Reply 4–5. Petitioner asserts that Martin discloses displaying map information on a mobile device and in a distributed computing environment, and argues that, "*Martin* bridges any gap between computer environments and communication among software agents within a distributed computing environment, and the use of map information with a PDA." *Id.* at 4. In so arguing, Petitioner misplaces reliance on *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1380 (Fed. Cir. 2019). *Id.*; Tr. 38:8–10 ("[Martin] discloses how the Open Agent Architecture can be used with PDAs [not] unlike that in the Steiner reference.").

As *Airbus* states, "the knowledge of a person of ordinary skill in the art, as demonstrated by particular prior art references, could be relevant to establishing the scope of the field of endeavor." *Airbus*, 941 F.3d at 1381. Prior art references other than the subject one can be important "as record evidence relevant to the knowledge and perspective of an ordinarily skilled artisan at the time of the invention." *Id.* Thus, *Airbus* stands for the proposition that other references may be used to better understand the

ordinary artisan's perspective as to the field of endeavor. However, in this case, Petitioner is not using Martin to help us understand what Steiner discloses to a person of ordinary skill in the art at the time of the invention. *See* Pet. Reply 4. Rather, Petitioner relies on Martin for material that Steiner does *not* disclose, arguing that Martin fills the gap between the '128 patent and Steiner. *Id.* Petitioner's implied argument that the combination of Martin and Steiner would result in something in the same field of endeavor as the '128 patent is not persuasive in showing that Steiner itself is in the same field of endeavor.

b. Reasonably Pertinent

"A reference is reasonably pertinent [and, thus, analogous art] if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992); *see In re GPAC Inc.*, 57 F.3d 1573, 1578 (Fed. Cir. 1995) (References are analogous art "when a person of ordinary skill would reasonably have consulted those references and applied their teachings in seeking a solution to the problem that the inventor was attempting to solve."). "[T]he purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve." *In re Clay*, 966 F.2d at 659. In considering whether a reference is reasonably pertinent, we are directed "to construe the scope of analogous art broadly" because "*familiar items may have obvious uses beyond their primary purposes*, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (quoting *KSR*, 550 U.S. at 402).

Patent Owner contends that the problem addressed by the '128 patent is "develop[ing] distributed systems involving communication and cooperation among software agents." PO Resp. 17 ("*Steiner*'s concern . . . is far afield from the problem addressed by the '128 Patent. There is no indication that a POSA trying to develop distributed systems involving communication and cooperation among software agents (*i.e.*, the '128 Patent), would look to personal handheld devices (*i.e.*, *Steiner*)."); *see also* PO Sur-reply 11 ("[T]he '128 Patent provides for '[c]ommunication and cooperation between agents [] brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents . . . .'" (quoting Ex. 1001, code (57) (Abstract))). Patent Owner argues that "[c]ritically, providing 'map information' or 'GPS to identify location' is not the focus of the '128 Patent." PO Resp. 18. Thus, Patent Owner argues that the problem addressed in the '128 patent pertains only to distributed systems and software agents. Patent Owner contrasts this with the prior art, contending that the problem addressed by Steiner is "creating an improved Personal Digital Location Assistant device." PO Resp. 16; *see also* Sur-reply 12 (same).

Petitioner, on the other hand, argues that both the '128 patent and Steiner relate to the same problem of "location determination for a map in a mobile device context." Pet. Reply 6.

The challenged '128 patent issued from an application that is a continuation-in-part of the application that issued as U.S. Patent No. 6,851,115 B1 ("the '115 patent"). Ex. 1001, code (63). The '115 patent describes "software-based architectures for communication and cooperation

among distributed electronic agents." Ex. 1006, 1:27–29. As Patent Owner admits, the subject matter newly added in the continuation-in-part application "concerns 'Distributed Agents in a Highly Mobile, Ambient Computing Environment,' and specifically discusses the use of GPS, control of navigation systems, control of automobile sound systems, and interface and control of car entertainment centers." Prelim. Resp. 39 (citing Ex. 1001, 30:23–32:63). Thus, the '128 patent builds on its parent and represents an application of the distributed agent system in a mobile computing environment and utilizes a location agent. An example of this is navigation in a moving vehicle, as depicted in Figure 17 of the '128 patent, reproduced below.
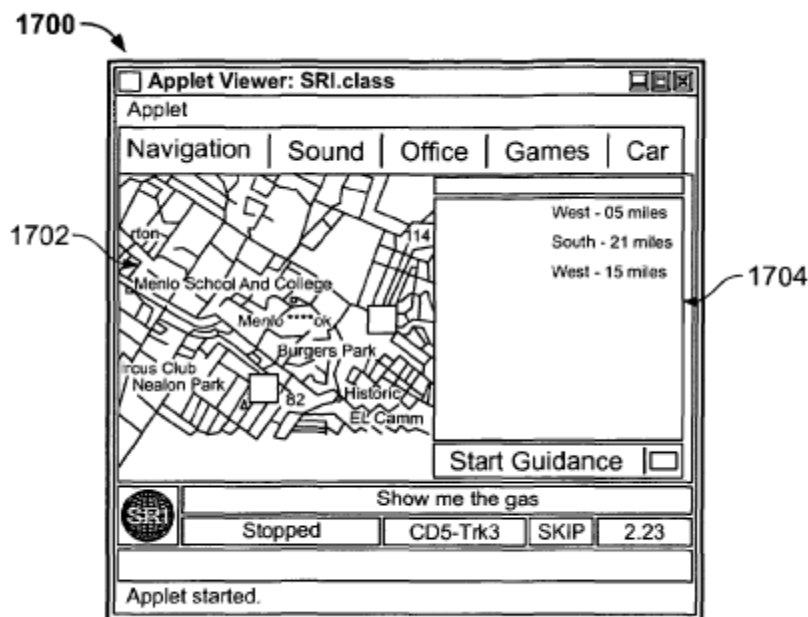

FIG. 17

Figure 17 above "is an illustration showing a navigation panel in accordance with one embodiment of the present invention [of the '128 patent]." Ex. 1001, 6:1–2.

Independent claim 1 of the '128 patent incorporates a location agent
into a mobile computing environment of distributed electronic agents,
specifically reciting "[a] collaborative computer-implemented community of
distributed electronic agents, organized to provide a mobile computing
environment . . . including at least one location agent operable to ascertain a
current physical location of a user." Ex. 1001, 35:27–29, 35:43–46. The
Specification explains, under the heading "Distributed Agents in a Highly
Mobile, Ambient Computing Environment":

> In another preferred embodiment of the present invention
> an application of the collaborative OAA architecture is
> provided which addresses the post-desktop, mobile/ubiquitous
> computing environment. *The present invention addresses the
> highly mobile computing environment by incorporating
> elements such as: GPS agents,* speech recognition (including
> other hands-free UI, multi-modal UI), and opportunistic
> connectivity among meeting participants (utilizing docked or
> IR-linked PDA's in addition to Internet sites), *by using
> autonomous service-providing electronic agents associated
> with available resources*, such as meeting resources.

Id. at 30:6–21 (emphases added). The Specification identifies, as examples
of the mobile computing environment, a car environment and a portable
computing device. *Id.* at 30:25–28. The Specification further explains:

> In addition, the present invention enables intelligent
> collaboration among agents including user interface agents for
> providing an ambient interface well suited for the mobile
> environment as just described, as well as location-aware agents
> providing current positional information through technologies
> such as Global Positioning System ("GPS"). Such
> collaboration yields powerful results greatly enhancing the
> mobile user's experience, as will now be described and
> illustrated.

Id. at 30:37–45.

A person of ordinary skill in the art at the time of the invention would have known that a distributed system involving communication and cooperation among software agents was known. *See* Ex. 1011,[7] 355 ("The Open Agent Architecture (OAA), developed and used for several years at SRI International, makes it possible for software services to be provided through the cooperative efforts of distributed collections of autonomous agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents."); Pet. Reply 4–5, 6 (citing Martin (Ex. 1011) in arguing that Steiner is analogous art); *see also* Tr. 37:13–39:3 (Petitioner responding to Patent Owner's Sur-reply). We evaluate whether Steiner is "reasonably pertinent" in light of the knowledge of the person of ordinary skill in the art at the time of the invention and in recognition that the challenged '128 patent, as a continuation-in-part, builds on its parent by implementing a distributed agent system in a mobile environment via the incorporation of location ascertainment. We find it inappropriate in this case to define narrowly the problem addressed by the '128 patent as being focused on only distributed

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[7] It is appropriate to consider Martin (Ex. 1011) in order to inform our understanding as to how the person of ordinary skill in the art at the time of the invention would perceive the problem addressed by the challenged patent and by the purportedly analogous art reference. *See Airbus*, 941 F.3d at 1382–83 (holding that the Board erred in failing to consider cited references in addition to the purportedly analogous one and explaining that, "[i]n order to determine whether a reference is 'reasonably pertinent,' then, a reasonable factfinder should consider record evidence cited by the parties to demonstrate the knowledge and perspective of a person of ordinary skill in the art at the time of the invention.").

agent systems, as Patent Owner advocates. *See* PO Sur-reply 12 (referring to "solv[ing] problems related to developing distributed systems involving communication and cooperation among software agents (i.e., the '128 Patent)."). We find that the problem addressed by the '128 patent includes a location ascertainment aspect.

Steiner explains that then-existing handheld GPS devices (those devices specifically configured for the limited purpose) as well as handheld computers coupled to GPS antennas had shortcomings. Ex. 1028, 5:26–52. Handheld GPS receivers at that time had "limited or no computing power, databases, or map display and [could not] use applications programmed in standard operating systems." *Id.* at 5:26–30. Handheld computers, on the other hand, had computing power for maps and utilized standard operating systems. *Id.* at 5:31–33. A limitation of those systems was that the user could not easily change the location determination application without purchasing duplicate GPS hardware. *Id.* at 5:50–52. Steiner identifies the problem to be addressed:

> What is needed is an handheld apparatus having a GPS antenna and receiver to provide location information, capable of using standard operating systems such as DOS, Windows, Macintosh, or Geoworks to run existing applications, and capable of running programs written in high level languages such as C to provide a mobile professional, a personal traveler, or a navigator with a display of his location and relative locations and the attributes of map features proximate to him.

Id. at 5:53–61.

Steiner is reasonably pertinent to the problem addressed by the '128 patent and would have commended itself to one seeking to solve that problem. Both are concerned with adapting a computing system to a mobile environment by the incorporation of GPS and the like in order to ascertain

the user's location on an electronic map. The mobile computing

environment of the '128 patent involves distributed electronic agents with

one being a location-aware agent, and the mobile computing environment of

Steiner is a handheld computer that may be easily reprogrammed with a

desired location determination application. The differences between these

computing environments do not, as Patent Owner argues, remove Steiner as

a reference that would be considered in addressing the problem of the

'128 patent.

　　　Patent Owner raises, in its Sur-reply for the first time, the argument

that "there is no evidence of foresight" to support a finding of analogous art

and, therefore, only hindsight remains. PO Sur-reply 12–13 (citing *Sci.*

Plastic Prod., Inc. v. Biotage AB, 766 F.3d 1355, 1359 (Fed. Cir. 2014)

("The pertinence of the reference as a source of solution to the inventor's

problem must be recognizable with the foresight of a person of ordinary

skill, not with the hindsight of the inventor's successful achievement.")).

Even treating this as a timely argument, we are not persuaded. Patent

Owner's assertion fails to acknowledge that the record contains evidence

indicating the understanding of the problems in the art through the lens of a

person of ordinary skill in the art at the time of the invention, including at

least Steiner itself (disclosing the known use of GPS), Martin, the

'128 patent (which describes the state of the art and explicitly ties GPS to

the named-inventors' endeavor), and Dr. Olsen's testimony (*see, e.g.*,

Ex. 1002 ¶¶ 16–60 (discussing that which, "during the time preceding

January 1999, a person of ordinary skill in the art would have been aware"),

62–66 (discussing the disclosures of Martin and Steiner), 98 ("Thus, *Steiner*

relates to usage of a personal computing device for providing map

information, so a person of ordinary skill in the art would have had reason to consider the teachings of *Steiner* when implementing *Martin*'s Open Agent Architecture, which is used for a map application (Multimodal Map) as I discussed above in this section.")). Patent Owner's late attempt to raise the specter of "hindsight" does not persuade us that a person of ordinary skill in the art at the time of the invention would fail to recognize, with foresight, the pertinence of Steiner to the '128 patent.

Although Patent Owner does not offer its own definition of the person of ordinary skill in the art, Patent Owner questionably argues that "providing 'map information' or 'GPS to identify location' is not the focus of the '128 Patent," PO Resp. 18, and, based on this, impliedly argues that a person of ordinary skill in the pertinent art would not have been "sufficiently aware of personal GPS devices (the focus of *Steiner*) to even look at such devices," *id.* at 15. Patent Owner makes much of Dr. Olsen's testimony on cross-examination that he had no opinion as to "[h]ow many people knew about [commercial mapping/portable personal mapping devices]." PO Resp. 15 (quoting Ex. 2024, 226:6–24). We do not find to be dispositive the fact that Dr. Olsen, in a 2019 deposition, could not remember the degree of commercialization of GPS in the 1999 timeframe. The better evidence is the contemporaneous reference. Steiner, having an issuance date of 1996, explains that GPS had many applications at that time. *See, e.g.*, Ex. 1028, 4:59–64 ("GPS is used by many professionals engaged in navigation and surveying fields such as marine navigation, aircraft piloting, seismology, boundary surveying, and other applications where accurate location is required or where the cost of GPS is small compared to the cost of a mistake in determining location."); *id.* at 5:1–3 ("GPS is also used for personal travel

such as hiking, biking, horseback riding, yachting, fishing, driving in personal cars, and other travel activities."). And notwithstanding Patent Owner's assertion that "GPS to identify location" is not the "focus" of the '128 patent, PO Resp. 18, that patent removes any doubt as to the ordinary artisan's knowledge on the subject in stating:

> New technology such as *Global Positioning System (GPS)*, wireless phones, wireless internet, and electronic controls *are currently available in cars* to improve the way people drive and manage the time spent in automobiles.

Ex. 1001, 30:46–49 (emphasis added). Lastly, as discussed above, the ordinary artisan at the time would have been a computer scientist, an electrical engineer, or similar, *supra*, Section II.B, and we decline to find that such a person would have had no knowledge of GPS as Patent Owner seems to suggest.

Accordingly, for the reasons explained above, we determine that Steiner is analogous art to the '128 patent.

4. The Alleged Obviousness of Claim 1 in View of Martin and Steiner

a. 1.[pre] A collaborative computer-implemented community of distributed electronic agents, organized to provide a mobile computing environment, the computer-implemented community of distributed electronic agents

Petitioner asserts that the Open Agent Architecture of Martin "is a computer-implemented community of distributed electronic agents, organized to provide a mobile computing environment." Pet. 21 (citing Ex. 1002 ¶ 79; Ex. 1011, Title). Petitioner also asserts that "because *Martin*'s community of distributed agents provide[s] services to a user on a personal digital assistant (PDA), which is a mobile computing device,

Martin's community of distributed agents provides a *mobile* computing environment." *Id.* at 24 (citing Ex. 1002 ¶ 82; Ex. 1011, 374). Patent Owner does not contest these assertions. Regardless of whether this preamble language is limiting, we find, based on the evidence cited by Petitioner, that it is disclosed in the asserted prior art. *Id.* at 21–25.

> b. *[1.a] an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), [1.b] wherein the interagent language includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and [1.c] wherein the parameter lists further refine the one or more events*

Petitioner argues that Martin discloses that service providers register capability specifications with a facilitator and that every agent participant in an OAA-based system publishes capability declarations in ICL. Pet. 25 (citing Ex. 1011, 362, 364; Ex. 1002 ¶ 85).

Quoting the reference, Petitioner notes that "*Martin* states that '[t]he ICL includes a layer of conversational protocol [that] is defined by the event types, together with the parameter lists that are associated with certain of these event types.'" *Id.* at 27 (quoting Ex. 1011, 363) (emphasis omitted, alteration in original).

Petitioner further argues that Martin explains that parameter lists refine the semantics of a request for service, which, according to Petitioner, is expressed by an "event." *Id.* at 28 (citing Ex. 1011, 363, 367; Ex. 1002 ¶ 88). Petitioner contends that, "because an event is used to request services and a request 'arrives in the form of an event' . . . , a POSITA would have understood that *Martin*'s disclosure of parameter lists refining a request also

discloses that the parameter lists refine events." *Id.* at 29 (citing Ex. 1002
¶ 89; quoting Ex. 1011, 364).

Patent Owner does not contest these assertions. We find, based on the
evidence cited by Petitioner, that these limitations 1.a, 1.b, and 1.c are taught
or suggested by Martin.[8] *Id.* at 25–32.

> c. *[1.d] a facilitator agent arranged to coordinate
> cooperative task completion among the electronic
> agents by delegating one or more received ICL goals to
> a selected one or more of the electronic agents based
> upon the registered capabilities of the selected agents*

Petitioner argues that Martin discloses that a facilitator agent
coordinates the efforts of the appropriate service providers to satisfy goals,
and that Martin also discloses task completions, thereby disclosing a
"facilitator agent [that] is arranged to coordinate cooperative task completion
among the electronic agents." Pet. 31–32 (citing Ex. 1002 ¶¶ 92–93;
Ex. 1011, 359, 362, Fig. 1). According to Petitioner, this coordination is
done based upon the registered capabilities of the selected agents. *Id.* at 32
(citing Ex. 1002 ¶ 94).

Patent Owner does not contest these arguments. We find, based on
the evidence cited by Petitioner, that this facilitator agent limitation is taught
or suggested by Martin. *Id.* at 31–33.

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[8] Petitioner also reasons that, if Martin does not explicitly disclose that the
parameter lists further refine the one or more events, it would have been
obvious in light of Martin's teachings and that which was common
knowledge in the art. Pet. 29–31 (citing Ex. 1002 ¶¶ 90–91; Ex. 1011, 363;
Ex. 1050 (Stroustrup), 153). In light of our findings here, we need not reach
this alternative argument.

> d. [1.e] one or more service-providing electronic agents,
> being in bi-directional communication with the
> facilitator agent, including at least one location agent
> operable to ascertain a current physical location of a
> user

Petitioner contends that the combination of Martin and Steiner

discloses this recitation. Pet. 33.

Petitioner asserts, and we agree, that Martin discloses multiple

application agents (mapped to the recited "one or more service-providing

electronic agents"). *Id.* at 33–34 (citing Ex. 1011, 361, Fig. 1). Petitioner,

relying on the testimony of Dr. Olsen, argues that those application agents

are in bi-directional communication with the facilitator. *Id.* at 34 (citing

Ex. 1011, 361, Fig. 1; Ex. 1002 ¶ 96). Petitioner contends that Martin's

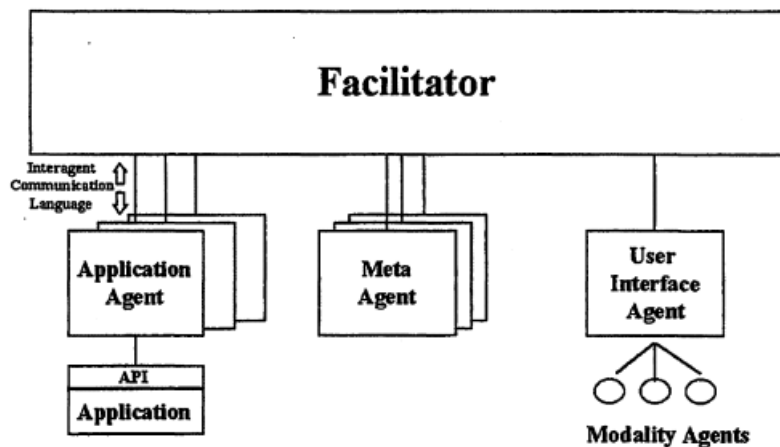Figure 1, reproduced below, supports its arguments. *Id.*

Figure 1: OAA System Structure.

Figure 1 depicts an OAA system structure where, among other things, there

is a line connecting an application agent to the facilitator and, next to that

connecting line, two arrows pointing in opposite directions along with the

phrase "Interagent Communication Language." Ex. 1011, 361. Martin, in

providing an overview of OAA system structure in the context of Figure 1,

states that "[t]he facilitator is a specialized server agent that is responsible

for coordinating agent communications and cooperative problem-solving."
Id. at 359.

Petitioner asserts, and we agree, that Martin discloses a Multimodal
Map application that displays a map to the user and that an application
implemented using OAA provides "[m]obile interfaces (PDA with
telephone)." Pet. 34 (quoting Ex. 1011, 360; citing Ex. 1011, 359–60;
Ex. 1002 ¶ 97); *see* Ex. 1011, 359 (describing an example of "the
Multimodal Map application, in which a user issues commands on a map by
drawing, writing and speaking, the spoken phrase 'Show a photo of the
hotel'").

Petitioner asserts that, although Martin discloses a Multimodal Map
application, it does not disclose that the application agents include the
recited location agent operable to ascertain a current physical location of a
user. Pet. 34. Petitioner turns to Steiner for this aspect of the limitation. *Id.*
at 35. Petitioner asserts, and we agree, that Steiner teaches a personal digital
location apparatus utilizing a GPS antenna for determining a geographic
location, where the apparatus displays a geographic location as an icon on a
map. *Id.* (citing Ex. 1028, Abstr., Title; Ex. 1002 ¶ 98). Petitioner describes
Steiner's use of a PDA with GPS, and asserts that "*Steiner* discloses
ascertaining a current physical location of a PDA, and thus also of a user of
the PDA." *Id.* at 35–36 (citing, *inter alia*, Ex. 1002 ¶ 99). We agree with
these assertions.

Petitioner's proposed combination is to "configure *Martin*'s
application agents to include at least one location agent operable to ascertain
a current physical location of a user" and to implement this in Martin's PDA
such that a location could be used to provide useful information to the user

via the Multimodal Map application. *Id.* at 36–37 (citing Ex. 1002 ¶ 100). In other words, Petitioner proposes to include, as one of its agents, a location agent in accordance with Steiner's teachings of location ascertainment and GPS. Petitioner's reasoning as to why one of ordinary skill in the art would be motivated to combine Martin and Steiner is discussed further below.

Patent Owner maintains that Petitioner fails to provide a clear mapping of claim limitations, arguing that it is unclear as to whether Steiner's teachings are being utilized for the "location agent" element or the "computer interface agent." PO Resp. 31–32. We disagree. Petitioner clearly relies on Steiner's teachings for the "location agent" limitation of limitation 1.e. *See* Pet. 35–37; *see also id.* at 37 (Petitioner arguing, for limitation 1.f, "*Martin* discloses that the Open Agent Architecture comprises a user interface agent ('one or more computer interface agents')").

Patent Owner assets that "[t]he term 'bi-directional' is not found in *Martin*" and argues that Petitioner has failed to explain how Martin discloses the recited "bi-directional communication." PO Resp. 32–33; *see also* PO Sur-reply 21–22. For the following reasons, we do not agree with this assertion or with Patent Owner's argument, which is made without the support of expert testimony, that "there is no description of communication flow paths in *Martin*." PO Resp. 33.

To the extent that Patent Owner requires the prior art to use the exact terminology as the claim, an obviousness determination is not an *ipsissimis verbis* test. *Cf. In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (addressing a similar concept in the context of anticipation). Instead, the test for obviousness is whether the references, taken as a whole, would have suggested the claimed subject matter to a person of having ordinary skill in

the art at the time the invention was made. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

As discussed above, the Petitioner relies on Martin's Figure 1 and Dr. Olsen's testimony as evidence of Martin's disclosure of bi-directional communication. *See* Pet. 34 (citing Ex. 1011, 361, Fig. 1; Ex. 1002 ¶ 96). Dr. Olsen testifies, under Martin's Figure 1 (reproduced above), that, in Martin, "the application agents are in bi-directional communication with the facilitator agent." Ex. 1002 ¶ 96. Martin's Figure 1 has two arrows pointing in opposite directions next to the connecting line between the application agent and the facilitator, and next to the label Interagent Communication Language. Ex. 1011, 351, Fig. 1. In reply to Patent Owner's argument that "there is nothing in *Martin* discussing such [bi-directional] communication," PO Resp. 32, Petitioner asserts that Figure 4 of the '128 patent, in a similar fashion, utilizes double-headed arrows connecting the Facilitator Agent and the Application Agent to disclose bi-directional communication, Pet. Reply 9. We note that those arrows in the '128 patent are overlaid with "Interagent Communication Language (ICL)." Ex. 1001, Fig. 4. Patent Owner does not offer any persuasive expert testimony in this regard and presents no plausible reason why a person skilled in an art involving a computer-implemented community of distributed electronic agents, Ex. 1011, 358–59, would fail to recognize Martin as disclosing, at least via the two-direction arrows, "bi-directional communication."

We find that Martin discloses, at least in Figure 1, the recited "bi-directional communications." We also find that the combination of Martin and Steiner teaches or suggests the limitation, "one or more service-providing electronic agents, being in bi-directional communication with the

facilitator agent, including at least one location agent operable to ascertain a current physical location of a user."

> e. [1.f] one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request

Petitioner argues that Martin discloses or suggests the last limitation in independent claim 1.[9] Pet. 37–40 (citing, *inter alia*, Ex. 1011, Figs. 1, 14–17, 21, 27; Ex. 1002 ¶¶ 102–105). Petitioner points to, *inter alia*, Martin's Figure 1 as disclosure of the Facilitator in bi-directional communication with the User Interface Agent (mapped to the recited computer interface agent) and persuasively explains, relying on Dr. Olsen's testimony, how Martin's User Interface Agent is operable to perform the recited "process" and "responsibly generate and present" functions. *Id.*

To the extent that Patent Owner's "bi-directional communications" argument is directed to this limitation 1.f, *see* PO Resp. 32–34, our discussion above, in the context of that phrase in limitation 1.e, applies equally here. Patent Owner does not otherwise contest Petitioner's arguments regarding this limitation 1.f. We find, based on the evidence

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[9] The Petition, in addressing this limitation 1.f, begins with the statement, "*Martin* in combination with *Steiner* discloses or suggests this limitation." Pet. 37. Petitioner does not mention Steiner again in this section, *id.* at 37–41, and confirms that it does not rely on Steiner for limitation 1.f, Pet. Reply 12. We do not find the clearly unintended mention of Steiner in the initial sentence to be fatal to the Petition, as Patent Owner urges. *See* PO Resp. 31–32; PO Sur-reply 20 (arguing that "[Petitioner] has not clearly stated its arguments and positions in the Petition").

cited by Petitioner, that this computer interface agent limitation is taught or suggested by Martin.[10] *Id.* at 37–40.

f. *Reasons to Combine the Teachings of Martin and Steiner*

As we noted above, for limitation 1.e, Petitioner argues that "*Martin* does not explicitly disclose that its application agents ('service-providing electronic agents') include a *location agent operable to ascertain a current physical location of a user*, but it would nevertheless have been obvious in view of *Steiner* to configure *Martin*'s community of agents to implement such features." Pet. 35 (citing Ex. 1002 ¶ 97).

Petitioner provides the following reasoning.

> In light of *Steiner*'s disclosures, a POSITA would have been motivated to configure *Martin*'s application agents to include at least one location agent operable to ascertain a current physical location of a user. (Ex. 1002, ¶100.) Given that *Martin* discloses an application that uses a PDA (Ex. 1011, 360) (Automated Office is explicitly identified as using a PDA, but a POSITA would have understood this to apply to any of *Martin*'s applications) and *Steiner* discloses determining the location of a PDA, a POSITA would have found it beneficial to ascertain the location of the user of *Martin*'s PDA so that, e.g., such location information could be used for providing relevant information to the user via *Martin*'s Multimodal Map application. (Ex. 1011, 360; Ex. 1002, ¶100.)

Id. at 36–37. Thus, Petitioner's proposed combination is the modification of one of Martin's agents to be a location agent in accordance with Steiner's

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[10] Petitioner further argues in the alternative that, "if *Martin* is deemed not to disclose that the *user interface* agent in particular is operable in the above manner . . . , it would have been obvious to configure *Martin*'s community of agents to implement this feature." Pet. 40 (citing Ex. 1002 ¶ 106; Ex. 1011, 361–62). In light of our findings here, we need not reach this alternative argument.

teachings. Petitioner further contends that this configuration would have been straightforward to implement, a combination of known components and technologies, and would have been according to known methods to produce predictable results. *Id.* at 37 (citing Ex. 1011, 361; Ex. 1002 ¶ 101).

Patent Owner argues that Petitioner has relied on the '128 patent as a roadmap and, therefore, Petitioner has engaged in improper hindsight. PO Resp. 26; PO Sur-reply 13–19. Patent Owner contends that Martin does not provide a motivation to combine references because it merely discloses the Multimodal Map as an application applying OAA and is not directed to solving problems with or improving navigation and mapping systems. PO Resp. 22–24, 28; PO Sur-reply 15 ("[T]he mapping example in the specification is merely an example of an application (one of many different applications, in fact) that was able to operate with OAA."). This argument is not persuasive because "neither the particular motivation nor the avowed purpose of the patentee controls." *KSR*, 550 U.S. at 419. A person of ordinary skill in the art would not fail to appreciate Martin's teaching of the use of OAA with a mapping application even if that was offered as only one example among many. *See id.* at 421 ("A person of ordinary skill is also a person of ordinary creativity, not an automaton.").

Patent Owner argues that Petitioner has failed to explain "how to combine references." PO Resp. 29 (section heading). Along these lines, Patent Owner first asserts that Petitioner has failed to explain how to reconfigure Martin's applications agents such that one is a location agent. *Id.* at 34. The evidentiary record, however, does not persuade us that creating or modifying application agents was anything other than routine to one of ordinary skill in the art at the time of the invention. *See id.* at 34–38

(presenting, almost exclusively, attorney argument with discussions of other cases rather than addressing the matter as a factual issue based on the evidence in this case). In contrast, Dr. Olsen presents credible and unrebutted testimony that the proposed combination involves known methods and would have been straightforward to implement and would have produced predictable results. Ex. 1002 ¶ 101. Consistent with that testimony, Martin indicates that the level of skill of the ordinary artisan at the time was high and that one was familiar with electronic agents, and Martin even teaches the utilization of a mapping application in the OAA context. *See, e.g.*, Ex. 1011, 359–61. We find that a person of ordinary skill in the art would have known how to configure Martin's agents as proposed by Petitioner and would have been able to do so, and that the combination would have yielded predictable results.

Patent Owner next argues that Petitioner's proposed combination yields an inoperable system. PO Resp. 38–42. Patent Owner's argument is best summarized in its Sur-reply, where it asserts that "[Petitioner] Google does not explain how a non-networked device (i.e., *Steiner's* device) is implemented in a distributed network, which is a glaring defect in the Petition." PO Sur-reply 24; *see also id.* at 1 (arguing that the combination "is not operable because *Steiner* is a self-contained device incapable of sharing information with other devices, which is a prerequisite for combining *Steiner* with *Martin*'s distributed agent system"); PO Resp. 40 (arguing that Steiner's "location information is provided only internally . . . [within] Steiner's standalone device" and "[t]he Steiner device has no means of sending location information to other devices" (emphasis omitted)). Patent Owner's argument is not persuasive as it is based on a

mischaracterization of Petitioner's proposed combination and a misapplication of the law. Petitioner is not, as Patent Owner implies, bodily incorporating Steiner's *device*—a handheld GPS unit—into Martin's network. Rather, Petitioner proposes to combine the references' *teachings* (not two physical devices), specifically applying Steiner's location ascertainment teachings by having one of Martin's agents be a location agent. *E.g.*, Pet. 36–37; *see In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art."). Petitioner has presented adequate and persuasive evidence that a person of ordinary skill in the art at the time of the invention would have been able to make this modification, and we find that the proposed combination results in an operable system. *See* Pet. 37; Ex. 1002 ¶¶ 100–101.

Having considered all of the parties' arguments and evidence, we determine that Petitioner has provided adequate reasoning as to why one of ordinary skill in the art would have modified Martin's distributed agent system by incorporating location ascertainment in accordance with Steiner's teachings and that this combination yields the subject matter of claim 1, and that Petitioner has provided adequate evidence to show that a person of ordinary skill in the art would have had a reasonable expectation of success in doing so.

g. *Conclusion as to Independent Claim 1*

Based on the foregoing, Petitioner has established by a preponderance of the evidence that independent claim 1 is unpatentable over the combination of Martin and Steiner.

> 5. *The Alleged Obviousness of Dependent Claims 2, 5, 20, and 21
> Over Martin and Steiner*

Petitioner also contends that claims 2, 5, 20, and 21 would have been obvious based on the same combination of prior art. Pet. 42–49. These challenged claims depend directly from independent claim 1. Petitioner identifies teachings in the prior art references that teach or suggest the limitations of these dependent claims and provides persuasive reasoning as to why the claimed subject matter would have been obvious to one of ordinary skill in the art. *Id.* Petitioner also supports its contentions for these claims with the testimony of Dr. Olsen. Ex. 1002 ¶¶ 107–117.

To the extent that Patent Owner argues that Petitioner's mapping of the limitations of dependent claim 2 is unclear, we do not agree. *See* PO Resp. 32–33 (quoting Pet. 43). Petitioner clearly relies on Martin for the recited computer interface agent feature and on Steiner's teachings for the location ascertaining feature. Pet. 42–43 (referring to the arguments for the underlying independent claim 1); *id.* at 35 (location agent of limitation 1.e), 37 (computer interface agent of limitation 1.f).

Patent Owner does not present any additional arguments for these dependent claims other than what we have considered already with respect to independent claim 1. *See, e.g.*, PO Resp. 37–38 (arguing that Petitioner failed to meet its burden regarding the location agent limitation 1.e and, therefore, "[i]ndependent claim 1 should be confirmed patentable, along with dependent claims 2–12 and 20–21").

We have considered the evidence and arguments of record and determine that Petitioner has demonstrated by a preponderance of the evidence that dependent claims 2, 5, 20, and 21 would have been obvious

based on Martin and Steiner for the reasons discussed in the Petition as supported by the testimony of Dr. Olsen.

E. Remaining Grounds of Obviousness

The remaining grounds (Grounds 2–6) pertain to claims that depend directly or indirectly from independent claim 1. Petitioner provides argument and evidence in support of its contentions that (1) claim 3 would have been obvious over Martin, Steiner, and Tamai (Pet. 49–51; Ex. 1002 ¶¶ 118–122); (2) claim 4 would have been obvious over Martin, Steiner, and Trovato (Pet. 52–55; Ex. 1002 ¶¶ 123–127); (3) claim 6 would have been obvious over Martin, Steiner, Anagnostopoulos, and Tamai (Pet. 55–58; Ex. 1002 ¶¶ 128–133); (4) claims 7–11 would have been obvious over Martin, Steiner, and Obradovich (Pet. 58–70; Ex. 1002 ¶¶ 134–150); and (5) claim 12 would have been obvious over Martin, Steiner, Obradovich, and Hurst (Pet. 70–73; Ex. 1002 ¶¶ 152–159).

In each of the grounds, Petitioner identifies teachings in the prior art references that teach or suggest the limitations of these dependent claims and provides sufficient reasoning as to why a person of ordinary skill would have combined the asserted references' teachings. *See* Pet. 49–73.

Much of Patent Owner's arguments for these grounds are substantively the same or similar to those addressed above in the context of Petitioner's challenge based on the combination of Martin and Steiner. *E.g.*, PO Resp. 2 ("[F]or Grounds 1–5, the Petition does not offer sufficient motivation to combine" and presenting the generalized "hindsight" argument); *id.* at 20–21 (hindsight regarding the use of various references); *id.* at 24–26 (arguing that "*Martin*'s Multimodal Map [is] only being mentioned as an example of an application applying OAA," and then

quoting Petitioner's reasoning for the various references); *id.* at 42 ("Grounds 2-6 build on the faulty foundation of purportedly combining *Martin* with *Steiner* and add additional references to the mix (up to four references for Grounds 4 and 6). . . . However, these combinations suffer from the same deficiencies discussed above.").

Regarding Petitioner's challenge to dependent claim 4 as being obvious over Martin, Steiner, and Travato (Ground 3), Patent Owner argues that the proposed combination is inoperable. PO Resp. 47–48. Patent Owner argues that, "[s]imilar to *Steiner*, *Trovato's* device is not only incapable of bi-directionally communicating with other agents using ICL, it is not capable of communicating with other devices or agents at all" and that there is no "showing of how to combine *Trovato's* standalone device with *Martin's* agents." *Id.* at 48. Dependent claim 4 calls for the map information of dependent claim 2 to include spoken directions by means of a text-to-speech output agent. Ex. 1001, 35:63–65. Petitioner asserts that Martin discloses text-to-speech output and argues that, "[t]o the extent *Martin* and *Steiner* do not explicitly disclose that the map information includes spoken *directions* by means of a text-to-speech output agent, it would have been obvious in further view of *Trovato* to implement this feature in the combined *Martin-Steiner* community of agents." Pet. 52–54 (citing Ex. 1002 ¶ 123–127). Petitioner's proposed combination "configure[s] *Martin*'s map information to include spoken *directions* as in claim 4." *Id.* at 54. Petitioner does not, as Patent Owner argues, propose bodily incorporating the embodiment of Travato into Martin's system, and Travato's "standalone device" configuration does not undermine Petitioner's proposed combination.

Having considered all of the parties' arguments and evidence regarding Grounds 2 through 6, we determine that Petitioner has provided adequate reasoning as to why one of ordinary skill in the art would have modified Martin's distributed agent system in light of the other cited references' teachings, that the proposed combinations yield the respective subject matter of the challenged dependent claims, and that Petitioner has provided adequate evidence to show that a person of ordinary skill in the art would have had a reasonable expectation of success in doing so.

F. Patent Owner's Takings and Appointments Clause Arguments

Patent Owner argues that "subjecting a patent effectively filed before September 16, 2012 (when the relevant provisions of the Leahy-Smith America Invents Act went into effect) to *inter partes* review is an impermissibly retroactive, unconstitutional taking" and "violates the Due Process Clause of the Fifth Amendment by eviscerating the Patent Owner's substantive vested rights." PO Resp. 49; *see* PO Sur-reply 24. We decline to consider Patent Owner's constitutional challenge as the Federal Circuit addressed this issue in *Celgene Corp. v. Peter*, 931 F.3d 1342, 1362–63 (Fed. Cir. 2019).

Patent Owner also argues that "*inter partes* review violates the Appointments Clause of the U.S. Constitution" and "notwithstanding the Federal Circuit's recent opinion in *Arthrex*, the 'statutory limitations on the removal of [Administrative Patent Judges]' under Title 5 are not severable by the Federal Circuit." PO Resp. 49 (citing *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1338 (Fed. Cir. 2019), *cert. granted sub nom. United States v. Arthrex, Inc.*, 2020 WL 6037206 (Oct. 13, 2020)). We

decline to consider Patent Owner's Appointments Clause challenge as the Federal Circuit addressed this issue in *Arthrex*, 941 F.3d at 1325, 1337–38.

III. CONCLUSION[11]

Petitioner has shown by a preponderance of the evidence that claims 1–12, 20, and 21 of the '128 patent would have been obvious.

IV. ORDER

For the foregoing reasons, it is

ORDERED that claims 1–12, 20, and 21 of the '128 patent have been proven to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1, 2, 5, 20, 21	103(a)	Martin, Steiner	1, 2, 5, 20, 21	
3	103(a)	Martin, Steiner, Tamai	3	

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[11] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

4	103(a)	Martin, Steiner, Trovato	4	
6	103(a)	Martin, Steiner, Anagnostopoulos, Tamai	6	
7–11	103(a)	Martin, Steiner, Obradovich	7–11	
12	103(a)	Martin, Steiner, Obradovich, Hurst	12	
Overall Outcome			1–12, 20, 21	

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